FURMAN®

220V-240V PRO LINE PRODUCT BROCHURE

ADVANCED POWER MANAGEMENT SOLUTIONS FOR AUDIO, VIDEO, AND BROADCAST PROFESSIONALS

Founded in 1974,

Furman is the leading provider of power management solutions for audio, video and broadcast professionals. From pioneering the concept of power conditioning in 1983 to introducing advanced technologies such as Series Multi-Stage Protection and Linear Filtering Technology, Furman is committed to providing the highest level of performance and protection to equipment used in mission-critical applications around the world.

THE FURMAN DIFFERENCE

For over 35 years, Furman has been the industry's most trusted name in AC conditioning, regulation, balanced isolation transformers, sequencing and distribution for audio, video, and broadcast professionals. Our clients include respected professional musicians, renowned recording studios, commercial contractors, and touring groups that handle major concert tours across the world. They choose Furman because of our reputation for reliability, our engineering expertise, and our years of experience focusing on the specific needs of industry professionals that cannot afford equipment failure or downtime.

Furman's trusted reputation has been earned by the millions of dollars of equipment that we have saved from power problems around the world and our innovation of technologies that maximize the performance of A/V systems. For our clients, operating a system that is not delivered safe, clean power by a Furman unit is simply out of the question.

FURMAN FEATURES AND TECHNOLOGIES

SMP
SERIES MULTI-STAGE
PROTECTION

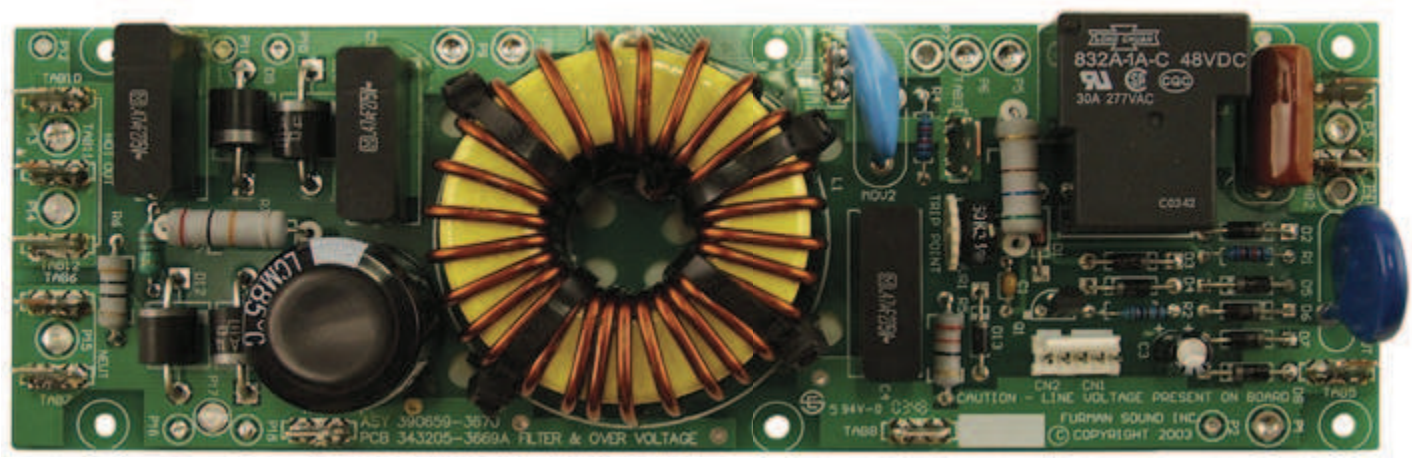
SERIES MULTI-STAGE PROTECTION (SMP)

Audio/video professionals can never accept down time, corrupted data, or unreliability. It is for this reason that a robust, professional level transient voltage surge suppression system, such as **SMP**, is the best choice for critical applications.

With **SMP**, there is virtually no downtime. In fact, the circuit is tested to handle multiple 6000 volt or 3000 amp pulses without sustaining any damage. This is far beyond the demands placed on typical surge suppressors. But because of the extreme conditions and critical applications faced by Furman's clients, the **SMP** circuit has been designed to pass this severe test and ensure that equipment damage or maintenance is extremely unlikely.

Furman's **SMP** relies on a network of components to slow down the impact of a potentially catastrophic surge by capturing it, dissipating it in the form of heat, and absorbing the remaining excess energy. When tested with multiple 6,000V/3,000A surges, the **SMP** circuit's maximum let-through voltage is only 376V Pk / 266V RMS on a 230V line. Due to the design of the circuit, it will not degrade over time (unlike most standard surge suppressors) and show minimal increase in line impedance (unlike many advanced surge suppressors).

The **SMP** circuit is not simply designed to protect from a catastrophic surge, such as a lightning strike - it is engineered to provide maximum life to connected equipment. This means it not only protects from devastating spikes and surges, but also offers protection from the dozens to hundreds of small spikes and surges your equipment is exposed to on a daily basis. These common voltage fluctuations, although small, can have a serious adverse effect over the long-term. Even when protected by a standard surge protector, digital circuits can see long-term damage due to exposure of voltage on the ground line, causing intermittent behavior, equipment lock-ups, and data loss. By absorbing these everyday surges without deterioration of the circuit or contamination of the ground line, Furman's **SMP** maximizes the longevity of connected equipment and minimizes the risk of downtime or failure in mission-critical applications.



EXTREME VOLTAGE SHUTDOWN (EVS)

Transient spikes and ground contamination are not the only problems faced by today's sensitive electronics. There are also sustained over voltage conditions, sometimes called extreme voltages. Many surge suppression devices will not be able to protect equipment from sustained over voltages. These conditions can occur for multiple reasons: wiring faults, storms and traffic accidents, and accidental connections can result in delivery of over 400V to your connected equipment. Many surge suppression devices are not equipped to handle these kind of conditions. Without proper protection, the end result is destroyed equipment, or at best, a destroyed surge suppression system.

Standard power strips are not equipped to handle sustained overvoltage conditions.

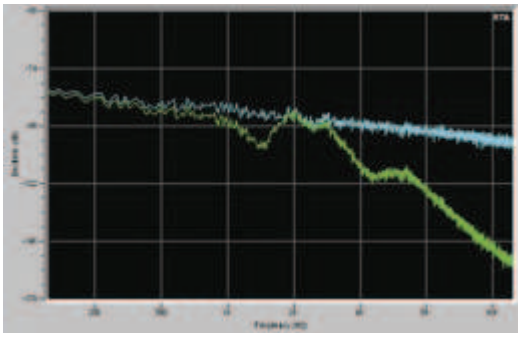
Furman's EVS constantly monitors incoming voltage, and once any overvoltage condition over 275 volts AC is detected, a relay opens which immediately shuts down the unit and all connected equipment. An indicator light informs the user there is a problem, and once the condition has been corrected, the unit may be reset and will operate normally.

LINEAR FILTERING TECHNOLOGY (LIFT)

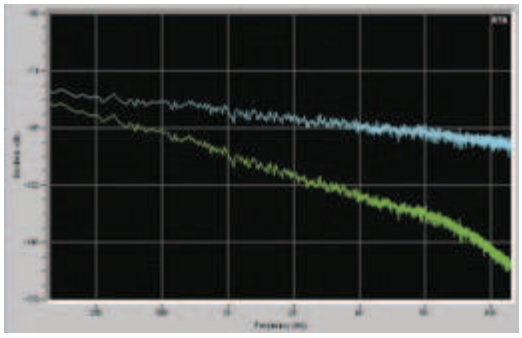
While delivering your power, your AC tap also delivers a significant amount of line noise. This is due to many reasons: the widening popularity of switching power supplies and the harmonics they backfeed into our AC power mains, the deterioration of our power grid from age and use, and the noise pollution generated from the massive amounts of electronic devices on our grid at any given time, among others. When this AC noise couples into critical circuits, it will distort and mask low-level signal information. This information is vital to today's high-performance, high-definition video and audio.

Furman's LiFT employs a finely tuned low-pass filter to reduce the differential AC noise coming through your line. What is significant about Furman's filtering is that it reduces the AC noise in a linear fashion across a very wide bandwidth. Prior filtering schemes (such as those found in most AC conditioners and in Furman's own conditioners prior to developing LiFT) reduce noise unevenly, creating a noise attenuation curve that resembles a roller coaster. This is akin to a poor job of equalizing a recording.

Real-Time AC Noise Filtering Analysis - Decibel Level vs. Frequency
Blue Line: Input AC, Green Line: Output AC (Post-Filter)



Output of real-time noise analysis software, showing the noise attenuation curve of a standard AC noise filter. Note the uneven shape of the output curve (the green line).

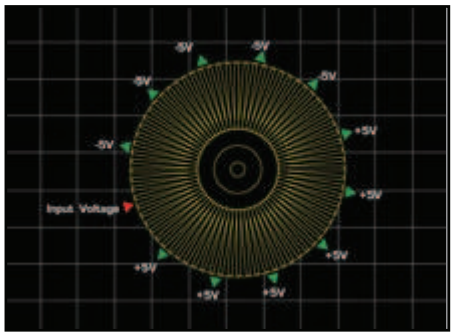


Output of the same analysis using Furman's Linear Filtering Technology. As you can see, the output noise attenuation curve is smooth and linear, without the resonant peaking seen in the standard filter.

With Furman's LiFT, differential AC noise is reduced linearly, across a very wide bandwidth, even extending into the video frequencies. This results in a lower noise floor for your audio system, improved picture on your video display, and protection from possible data corruption and losses caused by low-level differential AC noise fed into digital systems

TRUE RMS VOLTAGE REGULATION

Another power quality issue facing today's electronics is irregular voltage. While we may expect constant voltage to be supplied by our power utility, such an expectation is not realistic. Because of the chaotic demands on many power facilities and deterioration of power lines, AC voltage is often reduced so that it can be stretched to fulfill excess demand. This creates a substantial negative impact on your A/V equipment performance. Additionally, many regions and many applications require equipment be run by generator power. Since generators typically have voltage output specifications based on a constant current load, they are far from ideal for use in an A/V system which will typically see massive swings in the current draw. For this reason, generator power should always be followed by voltage regulation in an A/V application.



True RMS Voltage Regulation is achieved through the use of an ultra-quiet, microprocessor controlled autoformer with solid-state switching

Today's power supplies are designed to operate at their optimum input - anywhere between 120V to 240V, depending on the region. When the voltage delivered is higher than the regional standard, your equipment is subject to extra electricity that can overheat or damage your equipment. When the voltage is lower than optimal, your equipment's power supply must work harder to create more electrical current in order to make up for the difference, creating a "tug-of-war" in your power supply. This can cause your equipment to malfunction or sustain permanent damage.

Furman's True RMS Voltage Regulation is designed around an ultra-low noise toroidal autoformer. A microprocessor within the regulator monitors the incoming RMS voltage with each cycle, measuring the phase angle in time with the advancing cycle. Most commercial voltage regulators using multiple-tapped transformers switch taps at uncontrolled times. This creates voltage spikes and clicks that can leak into audio. When a voltage fluctuation requires correction, Furman's True RMS Voltage Regulation advances a new tap with less stress than other technologies and, in turn, avoids distortion to the AC waveform. Hysteresis in the circuitry avoids the unnecessary switching back and forth between the adjacent taps (or "chatter") found in many commercial voltage regulators. If necessary, Furman's True RMS Voltage Regulation technology can switch taps as often as once each cycle and do so with a shorter recovery time than a commercial voltage regulator. In addition and unlike voltage regulators that employ ferroresonant transformers, Furman regulators are not sensitive to small errors in line frequency, making them ideal for use with generators. The autoformer's toroidal design assures minimal leakage of stray magnetic fields.

POWER SEQUENCING

Power sequencing is useful whenever various kinds of equipment must be powered up or down in groups, rather than all simultaneously. In audio systems, sequenced powering is often necessary to allow turn-on transients from low level amplifiers and processors to settle down before any power amps are turned on, because simultaneous powering would result in a loud, annoying, and potentially destructive "pop" reaching the speakers. And in any large system whose components present an inductive load to the AC line (including electric motors, power supplies, and power amplifiers of all kinds), sequenced powering can avoid excessive inrush currents that can cause circuit breakers to trip even though the steady-state currents are not excessive. Power sequencing is particularly suited to applications where large installations must be switched by inexperienced personnel.

ISOLATED OUTLET BANKS

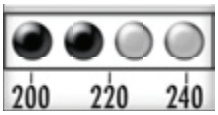
Isolation of rear panel outlet banks provides further noise reduction at the point of use by eliminating electrical cross-talk, which can be particularly troublesome when analog and digital equipment is plugged into the same circuit.

FRONT PANEL RETRACTABLE LIGHTS

Furman's signature front panel retractable lights provide convenient, discreet illumination to a rack full of equipment. Standard models include incandescent lights. Advanced models feature long-lasting, cool running LED lights.

DIAGNOSTIC LIGHTS

Diagnostic lights provide information regarding power quality and operational status of the Furman unit, including Protection OK indicator, Extreme Voltage indicator, and color-coded Voltage Range indicator (on select models).



LED VOLTMETER

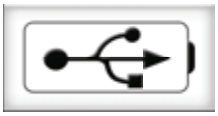
Segmented LED Voltage Meter. Indicates incoming voltage ranging from 180V to 254V. The LED's are color coded (Red=Stop, Yellow=Caution, Green=Go) to inform users at a glance if voltage is within a nominal range.

DIGITAL VOLTMETER

Laboratory-precision Digital Voltmeter displays incoming voltage.

DIGITAL VOLTMETER/AMMETER

Switchable, dimmable digital meter displays incoming voltage, switchable to output current in amps. Display also features Protection OK, Extreme Voltage, and color-coded Voltage Range indicators for comprehensive power monitoring.



USB CHARGER

Front-panel USB charger provides convenient charging outlet for most personal media devices and cell phones.

REAR PANEL BNC CONNECTOR

Rear-panel BNC Connector allows connection of BNC gooseneck lamp for rear rack illumination.

STANDARD LEVEL SURGE PROTECTION

Standard level, MOV-based sacrificial surge protection.

STANDARD LEVEL EMI/RFI FILTRATION

Standard level non-linear AC noise filtration.

MERIT X SERIES POWER CONDITIONERS

Furman's most affordable rackmount power conditioners feature eleven total outlets, standard level surge suppression, standard level EMI/RFI filtration, and a robust steel chassis.

M-10x E *10A Power Conditioner*

Standard Level Surge Protection | Standard Level RFI/EMI Filtration | 11 Outlets | 10A Rating | Protection OK Indicator

M-10Lx E *10A Power Conditioner*

Standard Level Surge Protection | Standard Level RFI/EMI Filtration | 11 Outlets | 10A Rating | Protection OK Indicator | Front Panel Retractable Lights

REAR PANEL (BOTH MODELS)

Merit X Series Specifications: **Maximum Output Current:**10 Amps. **Line Cord:** 1.5 meter, removable, IEC C-13 female to Schuko male. **Lamps (M-10Lx E):** Two multi-LED, dimmable lamps. **Spike Protection Mode:** Fused MOV, Line to neutral. **Operating Voltage:** 230VAC 50 Hz. **Energy Dissipation**: 305 joules. **Peak Impulse Current**: 12,000 amps. **Noise Attenuation (Transverse Mode):** Greater than 20dB, 1.5Mhz to 200 Mhz. **Dimensions:** 44.45mm H x 482.6mm W x 190.5mm D. **Weight:** 2.3 kg. **Safety Agency:** CE. **Warranty:** Three Year.

CLASSIC SERIES POWER CONDITIONERS

An update to Furman's popular Series II line, all Classic Series models feature advanced features such as SMP Surge Protection, EVS Voltage Protection, Linear Filtering Technology, pull-out LED lights, and isolated rear panel outlet banks.

PL-8C E *10A Advanced Power Conditioner*

SMP Advanced Surge Protection · Linear Filtering Technology · EVS Voltage Protection · 11 Outlets · 10A Rating · Diagnostic Lights · Isolated Outlet Banks · Front Panel Retractable Lights · Rear Panel BNC Connector for Gooseneck Lamp

PL-PLUS C E *10A Advanced Power Conditioner*

SMP Advanced Surge Protection · Linear Filtering Technology · EVS Voltage Protection · 11 Outlets · 10A Rating · Diagnostic Lights · Isolated Outlet Banks · Front Panel Retractable Lights · LED Voltmeter · Rear Panel BNC Connector for Gooseneck Lamp

REAR PANEL (BOTH MODELS)

Classic Series (10A) Specifications: **Maximum Output Current:**10 Amps. **Line Cord:** 2.5M, removable, IEC female to Schuko male. **Lamps:** Two multi-LED dimmable lamps. **Spike Protection Mode:** SMP, Line to neutral, zero ground leakage. **Maximum Continuous Operating Voltage:** 274V. **Let Through Voltage**: 376V Pk / 266V RMS @ 3,000 Amps. **Noise Attenuation (Transverse Mode):**10 dB @ 10 kHz, 40 dB @ 100 kHz, 50 dB @ 500 kHz. **BNC Connector:** 12VAC 500MA max (lamp not included). **Dimensions:** 482.6mm W x 266.7mm D x 44.45mm H **Weight:** 6 kg. **Safety Agency:** CE. **Warranty:** Five Year.

CLASSIC SERIES POWER CONDITIONERS (PRO MODEL)

Furman's Classic Series PL-PRO DMC E provides additional features such as a higher current capacity (16A), USB front panel charger, and dual digital voltmeter/ammeter with color-coded "Voltage Range" indicator.

PL-PRO DMC E *16A Advanced Power Conditioner*

SMP Advanced Surge Protection · Linear Filtering Technology · EVS Voltage Protection · 11 Outlets · 16A Rating · Diagnostic Lights · Isolated Outlet Banks · Dual Voltage/ Current Meter · USB Charger · Front Panel Retractable Lights · Rear Panel BNC Connector for Gooseneck Lamp

Classic Series (16A) Specifications: **Maximum Output Current:**16 Amps. **Line Cord:** 2.5M, removable, IEC female to Schuko male. **Lamps:** Two multi-LED dimmable lamps. **Spike Protection Mode:** SMP, Line to neutral, zero ground leakage. **Maximum Continuous Operating Voltage:** 274V. **Let Through Voltage**: 376V Pk / 266V RMS @ 3,000 Amps. **Noise Attenuation (Transverse Mode):**10 dB @ 10 kHz, 40 dB @ 100 kHz, 50 dB @ 500 kHz. **BNC Connector:** 12VAC 500MA max (lamp not included). **USB Circuit:** 500 mA@5VDC, USB-A Connector. **Dimensions:** 482.6mm W x 266.7mm D x 44.45mm H **Weight:** 6 kg. **Safety Agency:** CE. **Warranty:** Five Year.

COMPACT POWER CONDITIONER

Ideal for flat panel televisions, video projectors, or anywhere advanced power conditioning is needed for components away from the main equipment rack, The AC-210E provides advanced protection and filtration in a compact, 44.5mm H x 127mm W x 216mm D chassis.

AC-210E *10A Compact Advanced Power Conditioner*

SMP Advanced Surge Protection · Linear Filtering Technology · EVS Voltage Protection · 2 Outlets · 10A Rating · Diagnostic Lights

AC-210E Specifications: **Maximum Output Current:**10 Amps. **Line Cord:** 2.5M, removable, IEC female to Schuko male. **Spike Protection Mode:** SMP, line to neutral, zero ground leakage. **Maximum Continuous Operating Voltage:** 274V. **Let Through Voltage**: 376V Pk / 266V RMS @ 3,000 Amps. **Noise Attenuation (Transverse Mode):**10 dB @ 10 kHz, 40 dB @ 100 kHz, 50 dB @ 500 kHz. **Dimensions:** 44.5mm H x 127mm W x 216mm D. **Weight:** 1.36 kg. **Safety Agency:** CE. **Warranty:** Three Year.

PRESTIGE SERIES VOLTAGE REGULATOR/POWER CONDITIONERS

Furman's Advanced Voltage Regulators/Power Conditioners provide consistent voltage (selectable between 230V and 240V, ±10V) output while also offering all of the advanced protection and noise filtering benefits of Furman's advanced power conditioning technologies.

P-1400 AR E *6A Advanced Voltage Regulator/Power Conditioner*

SMP Advanced Surge Protection | Linear Filtering Technology | EVS Voltage Protection | True RMS Voltage Regulation | 11 Outlets | 6A Rating | Diagnostic Lights | USB Charger | Isolated Outlet Banks | Dual Voltage/ Current Meter | Rear Panel BNC Connector for Gooseneck Lamp

P-1400 AR E Specifications: **Maximum Output Current:** 6 Amps. **Output Voltage:** Selectable between 230V and 240V, ±10V. **In Regulation Range:** 174 to 264 VAC. **Line Cord:** 2.5M, removable, IEC female to Schuko male. **Spike Protection Mode:** SMP, Line to neutral, zero ground leakage. **Maximum Continuous Operating Voltage:** 275V. **Let Through Voltage**: 376V Pk / 266V RMS @ 3,000 Amps. **Noise Attenuation (Transverse Mode):**10 dB @ 10 kHz, 40 dB @ 100 kHz, 50 dB @ 500 kHz. **USB Circuit:** 500 mA@5VDC, USB-A Connector. **BNC Connector:** 12VAC 500MA max (lamp not included). **Dimensions:** 482.6mm W x 305mm D x 45mm H **Weight:** 7 kg. **Safety Agency:** CE. **Warranty:** Five Year.

P-6900 AR E *30A Advanced Voltage Regulator/Power Conditioner (Available Q2 2009)*

SMP Advanced Surge Protection | Linear Filtering Technology | EVS Voltage Protection | True RMS Voltage Regulation | 11 Outlets | 30A Rating | Diagnostic Lights | USB Charger | Isolated Outlet Banks | Dual Voltage/ Current Meter

P-6900 AR E Specifications (Note - Preliminary Specifications, subject to change): **Maximum Output Current:** 30 Amps. **Output Voltage:** Selectable between 230V and 240V, ±10V. **In Regulation Range:** 174 to 264 VAC. **Line Cord:** 30A C-Form connector with female mating connector for termination of custom line cord. **Spike Protection Mode:** SMP, Line to neutral, zero ground leakage. **Maximum Continuous Operating Voltage:** 275V. **Let Through Voltage**: 376V Pk / 266V RMS @ 3,000 Amps. **Noise Attenuation (Transverse Mode):**10 dB @ 10 kHz, 40 dB @ 100 kHz, 50 dB @ 500 kHz. **USB Circuit:** 500 mA@5VDC, USB-A Connector. **Dimensions:** 482.6mm W x 406.4mm D x 133.35mm H (without line cord connector), 482.6mm W x 597mm D x 133.35mm H (with line cord connector). **Weight:** 26 kg. **Warranty:** Five Year.

POWER SEQUENCERS/CONDITIONERS

Furman's rackmount Power Sequencers/Conditioners provide solutions for control of system start-up and shut-down along with advanced power protection and filtration.

PS-8R E II *10A Advanced Power Sequencer/Conditioner*

SMP Advanced Surge Protection | Linear Filtering Technology | EVS Voltage Protection | Power Sequencing | 9 Outlets | 10A Rating | Diagnostic Lights | Isolated Outlet Banks | Rear Panel BNC Connector for Gooseneck Lamp

PS-8R E II Specifications: **Maximum Output Current:** 10 Amps. **Delay Banks:** 3 banks, adjustable delay, local or remote control. **Line Cord:** 2.5M, removable, IEC female to Schuko male. **Spike Protection Mode:** SMP, Line to neutral, zero ground leakage. **Maximum Continuous Operating Voltage:** 274V. **Let Through Voltage**: 376V Pk / 266V RMS @ 3,000 Amps. **Noise Attenuation (Transverse Mode):**10 dB @ 10 kHz, 40 dB @ 100 kHz, 50 dB @ 500 kHz. **BNC Connector:** 12VAC 500MA max (lamp not included). **Dimensions:** 482.6mm W x 266.7mm D x 44.45mm H **Weight:** 5 kg. **Safety Agency:** CE. **Warranty:** Thee Year.

PS-PRO E II *16A Advanced Power Sequencer/Conditioner*

SMP Advanced Surge Protection | Linear Filtering Technology | EVS Voltage Protection | Power Sequencing | 9 Outlets | 20A Rating | Diagnostic Lights | Isolated Outlet Banks | Rear Panel BNC Connector for Gooseneck Lamp

PS-PRO E II Specifications: **Maximum Output Current:** 16 Amps. **Delay Banks:** 3 banks, adjustable delay, local or remote control. **Line Cord:** 2.5M, removable, IEC female to Schuko male. **Spike Protection Mode:** SMP, Line to neutral, zero ground leakage. **Maximum Continuous Operating Voltage:** 274V. **Let Through Voltage**: 376V Pk / 266V RMS @ 3,000 Amps. **Noise Attenuation (Transverse Mode):**10 dB @ 10 kHz, 40 dB @ 100 kHz, 50 dB @ 500 kHz. **BNC Connector:** 12VAC 500MA max (lamp not included). **Dimensions:** 482.6mm W x 266.7mm D x 44.45mm H **Weight:** 5 kg. **Safety Agency:** CE. **Warranty:** Thee Year.

GOOSENECK LAMPS

GN-I / GN - LED *Gooseneck Lamps*

Furman's 12" gooseneck lamps provide incandescent (GN-I) and LED (GN-LED) illumination with a locking BNC connector, ideal for use with many Furman products that provide a rear BNC connector for discreet illumination at the back of an equipment rack.